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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/917,406	07/26/2001	Andrea Giovanni Cigada	853063.493	1065

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EXAMINER	
VU, QUANG D	

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 12/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/917,406	CIGADA ET AL.	
	Examiner	Art Unit	
	Quang D Vu	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *amendment filed on 06-30-03*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☒ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claim 4 is objected to because of the following informalities: In line 4, the phrase "...an overall thickness equal to or exceeding 1 mm" fails to clarify whether it is being referred to a individual or a combination thickness of the flash on the upper surface and lower surface of the frame. Appropriate correction is required.

2. Claim 11 is objected to because of the following informalities: In lines 2-4, the phrase "the flashing portion at least partially filling the hole includes a first portion formed on a first surface of the lead-frame facing away from the molded portion and a second portion formed on a second surface of the lead-frame facing toward the molded portion" fails to clarify whether it is being referred to a surface of the flashing portion or the lead-frame portion. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6, in lines 2-3, the phrase "the air vent by means of the hole of circular section gives rise to a flash only on the upper surface of the frame" is not fully consistent with what is

shown in fig. 6, in which the air vent gives rise to a flash on the upper and lower surface of the frame. Claim 1 shows the flash, which is formed on the upper and lower surfaces of the frame. Claim 6 shows the flash, which is formed only on the upper surface of the frame. Claim 6 contradicts with claim 1.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 16-19 and 22-26 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,665,296 to Jain et al.

Jain et al. (figures 1, 3) teach a structure comprising:

a frame (10); and

a mold (50) having at least one air vent from which the resin can seep out of during the injecting phase into the mold, the air vent being positioned between an upper (an upper portion of [50]) and a lower (a lower portion of [50]) surface of the frame (10), wherein the frame (10) includes a through hole (38) placed adjacent to an outlet of the air vent (a place injects the encapsulant) so that when the resin has solidified it forms a flash (a portion of the encapsulant formed on the upper surface and lower surface of the lead frame [10]) which is in coherence with one of the upper (an upper portion of [50]) and lower (a lower portion of [50]) surfaces of the frame (10).

Regarding claim 16, Jain et al. (figures 1, 3) teach a semiconductor lead frame (10) for an integrated circuit having a molded portion (50), wherein the molded portion (50) having one or more flashing portions (a portion of the encapsulant formed on the upper surface and lower surface of [50]) formed at peripheral extrusion areas (the edge portion of the package), the lead frame comprising:

a conductive skeleton having a support surface and a plurality of conductive strips (the leadframe [10] has strips of lead [16]) on the surface, the conductive strips defining an air vent zone of the surface that is structured for placement adjacent to one of the peripheral extrusion areas (the edge portion of the package), the air vent zone including a hole (38) in the surface for receiving a portion of one of the flashing portions (a portion of the encapsulant formed on the upper surface and lower surface of [50]).

Regarding claim 17, Jain et al. teach the hole (38) formed in a surface of the conductive strip (16) facing away from the molded portion (50).

Regarding claim 18, Jain et al. teach the hole (38) is aligned with the flashing portion (a portion of the encapsulant formed on the upper surface and lower surface of [50]). (column 2, lines 42-46).

Regarding claim 19, Jain et al. teach the hole (38) is a passage through the conductive strip.

Regarding claim 22, Jain et al. teach the hole (38) is spaced a predetermined distance away from air vent of the air vent zone (a place injects the encapsulant) (figure 3).

Regarding claim 23, Jain et al. (figure 1) teach a semiconductor device mounted on the support surface of the conductive skeleton (lead frame [10]); wherein the molded portion (50) is

formed over the semiconductor device, the one or more flashing portions (a portion of the encapsulant formed on the upper surface and lower surface of [50]) extending into the hole (38).

Regarding claim 24, Jain et al. teach the one or more flashing portions (a portion of the encapsulant formed on the upper surface and lower surface of [50]) extend across a surface of the conductive strip (a first surface of the flashing portion is on the left of the hole [38]) facing away from the molded portion (50).

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

8. Claims 8-12 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent No. 6,469,369 to Lee.

Regarding claim 8, Lee (figures 3-4) teaches an integrated circuit package, comprising:

a semiconductor device;

a flashing portion (a portion of the mold compound [250] formed in the groove [160] and formed on the lead frame [100] between the groove [160] and the inlet of the upper mold [240]) of molded material extruded from a molded portion at a peripheral area thereof; and

a lead-frame (100) external to the molded portion and having a hole (160) adjacent to the peripheral area of the molded portion having the flashing portion extruded therefrom, the flashing portion at least partially filling the hole (160).

It is inherent that the molded portion formed around the semiconductor device because it protects the semiconductor device.

Regarding claim 9, Lee inherently teaches the hole (160) is formed on an axis passing through the flashing portion.

Regarding claim 10, Lee teaches the hole (160) is a through-hole extending completely through the lead-frame (100).

Regarding claim 11, Lee teaches the flashing portion at least partially filling the hole includes a first portion formed on a first surface (a first surface of the flashing portion is on the right of the hole [160]) of the lead-frame facing away from the molded portion and a second portion formed on a second surface (a second surface of the flashing portion is on the left of the hole [160]) of the lead-frame facing toward the molded portion.

Regarding claim 12, Lee teaches the hole (160) is a recess formed in the lead frame (100).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 2-5, 7, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain et al.

Regarding claim 2, Jain et al. teach the other hole shapes can be used in the present invention (column 2, lines 47-50). Jain et al. differ from the claimed invention by not showing the hole has an ellipsoidal section. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the hole has an ellipsoidal shape because it provides the least amount of fluid resistance.

Jain et al. further differ from the claimed invention by not showing the minor diameter dimension of the hole shorter than the diameter of the air vent. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the minor diameter dimension of the hole shorter than the diameter of the air vent, since is has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F2.d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 3, Jain et al. teach the other hole shapes can be used in the present invention (column 2, lines 47-50). Jain et al. differ from the claimed invention by not showing the hole has a circular section. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the hole has an ellipsoidal shape because it provides the least amount of fluid resistance.

Jain et al. differ from the claimed invention by not showing the diameter dimension of the hole equal or shorter than that of the air vent. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the diameter dimension of the hole equal or shorter than that of the air vent, since is has been held that discovering an optimum value of a

result effective variable involves only routine skill in the art. In re Boesch, 617 F2.d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 4, Jain et al. differ from the claimed invention by not showing the air vent, in combination with the hole having an ellipsoidal section, gives rise to a flash of resin on the upper surface of the frame and to a flash of resin on the lower surface of the frame, with an overall the thickness equal to or exceeding 1 mm. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the air vent, in combination with the hole having an ellipsoidal section, gives rise to a flash of resin on the upper surface of the frame and to a flash of resin on the lower surface of the frame, with an overall the thickness equal to or exceeding 1 mm, since is has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F2.d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 5, Jain et al. differ from the claimed invention by not showing the hole with ellipsoidal section is positioned at a distance of more than 1 mm from the air vent. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the hole with ellipsoidal section is positioned at a distance of more than 1 mm from the air vent, since is has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F2.d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 7, Jain et al. differ from the claimed invention by not showing the hole with circular section is positioned at a distance of more than 1 mm from the air vent. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the hole with circular section is positioned at a distance of more than 1 mm from the air vent,

since is has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F2.d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 20, Jain et al. teach the other hole shapes can be used in the present invention (column 2, lines 47-50). Jain et al. differ from the claimed invention by not showing the hole is substantially circular in shape. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the hole has an ellipsoidal shape because it provides the least amount of fluid resistance.

Regarding claim 21, Jain et al. teach the other hole shapes can be used in the present invention (column 2, lines 47-50). Jain et al. differ from the claimed invention by not showing the hole is substantially ellipsoidal in shape. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the hole has an ellipsoidal shape because it provides the least amount of fluid resistance.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jain et al. in view of US Patent No. 6,469,369 to Lee.

Regarding claim 6, the disclosures of Jain et al. are discussed as applied to claims 2-5 and 7 above.

Jain et al. differ from the claimed invention by not showing the air vent gives rise to a flash only on the upper surface of the frame. However, Lee (figures 2 and 4) teaches the air vent gives rise to a flash (a portion of the mold compound [250] formed in the groove [160] and formed on the lead frame [100] between the groove [160] and the inlet of the upper mold [240]) only on the upper surface of the frame. Therefore, it would have been obvious to one having

ordinary skill in the art at the time the invention was made to incorporate the teaching of Lee into the device taught by Jain et al. because it increases the adhesion between the upper mold and the lead frame.

Jain et al. and Lee differ from the claimed invention by not showing the flash having a thickness from 20 to 25 micrometer. The thickness of the flash is considered to involve routine optimization while has been held to the within the level of ordinary skill in the art. As note In re Aller 105 USPQ 233, 255 (CCPA 1995), the selection of the reaction parameters such as thickness would have been obvious. Therefore, one of ordinary skill in the requisite art at the time of the invention was made would have used any thickness range suitable to the device of Jain et al. and Lee in order to optimize the device.

12. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,469,369 to Lee.

Regarding claim 13, Lee differs from the claimed invention by not showing the hole is substantially round in shape. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the hole is substantially round in shape because it improves the adhesion between the encapsulant material and the lead frame.

Regarding claim 14, Lee differs from the claimed invention by not showing the hole is substantially elliptical in shape. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the hole is substantially elliptical in shape because it improves the adhesion between the encapsulant material and the lead frame.

Regarding claim 15, Lee teaches the hole is spaced a predetermined distance away from the extrusion of the flashing portion from the molded portion.

Response to Arguments

Applicant's arguments with respect to claims 1-26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang D Vu whose telephone number is 703-305-3826. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 703-308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

qv
December 10, 2003

Steven Loke